WHAT IS CLAIMED IS:

1. A method for reconstructing motor phase currents in an inverter motor drive system by measuring DC link current, comprising:

supplying PWM control signals to inverter switches for switching current in the motor phases;

sampling DC bus current to obtain a DC bus current measurement;

modifying PWM control signals supplied to the inverter switches near sector boundaries to provide intervals where DC bus current may be sampled; and

calculating motor phase currents based on the sampled DC bus currents measurements obtained during the intervals.

2. The method according to claim 1, further comprising modifying PWM control signals for a plurality of phases.

3. A space vector modulation control apparatus for an inverter drive system, comprising:

a processor for executing instructions to provide inverter gate drive control signals;

a feedback signal coupled to the processor and representative of DC bus current;

a set of instructions executable by the processor and arranged to provide space vector modulation control;

a sequence in the instructions for modifying a PWM cycle of the gate drive control signals when a reference voltage vector is near a state vector boundary; and

another sequence of instructions for deriving motor phase currents based on the feedback signal to contribute to forming the gate drive control signals.

4. The apparatus according to claim 3, further comprising a sequence of instructions for modifying the gate drive control signals to permit the feedback signal to be correlated to motor phase currents.

5. The system according to claim 4, further comprising a current measuring device in the DC bus for generating the motor feedback signal.

6. A method for controlling a motor drive system using space vector modulation, comprising:

modifying PWM cycles when a reference vector is near sector boundaries;

obtaining a correlation between motor phase currents and DC bus currents when the PWM cycles are modified;

taking four or more current samples of the DC bus current when the PWM cycles are modified;

reconstructing motor phase currents from the current samples; and

applying the reconstructed motor phase currents to the motor drive system control.

7. The method according to claim 6, wherein reconstructing motor phase currents is performed according to the equations:

$I_U=(I_2 + I_4)/2$

$I_V=(-I_3 + I_1 - I_2)/2$

$I_W=(-I_1 + I_3 - I_4)/2$

where I_1 through I_4 represents the DC bus current samples.

8. The method according to claim 6, wherein reconstructing motor phase currents is performed according to the equations:

$I_U=(I_2 + I_3 - I_4)/2$

$I_V=(I_4 + I_1 - I_2)/2$

$I_W=(-I_1 - I_3)/2$

where I_1 through I_4 represent the DC bus current samples.

9. The method according to claim 6, wherein reconstructing motor phase currents is performed according to the equations:

$I_U=(I_4 + I_1 - I_2)/2$

$I_V=(I_2 + I_3 - I_4)/2$

$I_W=(-I_1 - I_3)/2$

where I_1 through I_4 represent the DC bus current samples.

10. The method according to claim 6, wherein reconstructing motor phase currents is performed according to the equations:

$I_U=(-I_3 + I_1 - I_2)/2$

$I_V=(I_2 + I_4)/2$

$I_W=(-I_1 + I_3 - I_4)/2.$

where I_1 through I_4 represent the DC bus current samples.

11. The method according to claim 7, further comprising modifying the PWM cycles near the 0-5 boundary, 1-2 boundary and 3-4 boundary.

12. The method according to claim 8, further comprising modifying the PWM cycles near the 0-1 boundary, 2-3 boundary and 4-5 boundary.

13. The method according to claim 9, further comprising modifying the PWM cycles near the 0-1 boundary, 2-3 boundary and 4-5 boundary.

14. The method according to claim10, further comprising modifying the PWM cycles near the 1-2 boundary, 3-4 boundary and 5-0 boundary.